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Poseidon's jewels

Riches lie below the waters of Russia's Arctic

Exploiting them could harm the environment

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Russia's largest component republic is Yakutia. It extends well into the Arctic Circle and is as big as Germany, France, Britain, Italy, Spain, Sweden, Finland and Romania combined, but with a population of just 1m people. Over the past decade retreating sea ice has opened up a new shipping lane along its coast, the Northern Sea Route (NSR). This is the shortest passage between the ports of east Asia and western Europe, but its icy waters also offer something even more precious: geological bounty, in the form of cobalt, tin and rare-earth metals, deep below the surface.

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Hostile weather and other obstacles to extraction make prospecting along the NSR a daunting venture. Nonetheless, numerous arms of the Russian state as well as private investors have already set their sights on these underwater minerals, in addition to the area's oil and gas. Discoveries of deposits on land give hope of further bounty offshore. Nodules—tiny balls of oxides scattered across the ocean floor, and first identified off the coast of Siberia—hold special promise. They contain minerals that can be used in everything from electronics to rechargeable batteries.

But there is a problem. The nodules are formed when seawater penetrates magma chambers deep below the sea floor. This water is heated to extreme temperatures before it ascends back towards the surface through chimney-like vents—in effect, submarine volcanoes. The process leaches metals out of the earth's crust and deposits them on the sea floor. But the vents also warm the water in their vicinity, which sustains remarkable ecosystems on the seabed. These habitats are little understood and would take decades to study fully. In the absence of proper environmental controls, biologists and oceanographers fear that mineral extraction around the vents could destroy irreplaceable habitats.

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"Impact assessment is easier to do on land," says Javier Escartin of the Laboratoire de Géologie, an academic institution in Paris. "We don't have data on the ocean, where ecosystems are often so fragile they don't recover in human timescales." An evaluation along the NSR would require sophisticated robots to collect samples and map the sea floor—endeavours that some argue would be so expensive that they would make exploitation of undersea resources unviable.

For now, Russian mining companies are guarded. Alrosa, Russia's largest diamond producer, describes Yakutia as "a northern frontier for short-term exploration", though the company provided no specifics. Nornickel, a big producer of nickel off the Taimyr peninsula, stresses the need for green construction standards but "does not conduct deep-sea mining and currently has no plans to do so". Yet in 2001 Russia submitted a claim to expand its exclusive economic zone from 200 nautical miles from the coast to as far, in some places, as the North Pole.

Completely icebound just 20 years ago, Yakutia's waters are now navigable by ordinary ships for four months a year, and global warming will probably widen that window. As the passage becomes busier, many see alarming risks: in addition to environmental impact studies, there are calls for greater protections for indigenous people, restrictions on dredging and pollution, and transparency regarding mining operations. "Regulation is insufficient, especially now that the Arctic is open for business," says Malte Humpert, founder of The Arctic Institute, an American think-tank. The NSR, it seems, is an emerging economic and environmental flashpoint, both above water and below. ■

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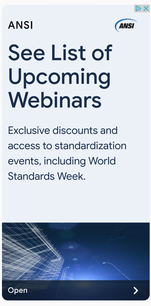

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